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Methodology proposal of the creation of competency models and competency model for the position of a sales manager in an industrial organisation using the AHP method and Saaty's method of determining weights

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ABSTRACT

The aim of this paper is to create a competency model for the position of a sales manager in a manufacturing industry organisation according to the proposed methodology of the competency models creation. The competency model will be created using the AHP method and Saaty's method of determining weights. There is briefly explained the issue of competencies and competency models in the introductory part of the paper and then the used methods are clarified. The application part of the paper describes the methodology of the competency model creation and the process of the competency model creation for the position of a sales manager. The proposed methodology for the creation of competency models can be used in organisations of various specialisation and for any job position. Created competency models can be mainly used for employee selection, training and development, employee evaluation and remuneration.

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1. Introduction

The employee competency concept can be traced back to an article by McClelland, in which the author does not directly define the word competency, but uses the term as a 'symbol for an alternative approach to traditional intelligence testing' (Cardy & Selvarajan, 2006; McClelland, 1973, p. 7). In this approach, McClelland advocates the use of skill sets related to performance on the criteria based on criterion sampling. The term competency was introduced to the Human Resources management in the early 80's of the twentieth century. In 1982 the American scholar Richard Boyatzis wrote his book 'The Competent Manager: A Model for Effective Performance', which exerted serious influence among human resources management specialists. For over three decades now, competencies and competency models have become an inseparable part of Human Resources management and have been widely used as means for increasing personal

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and organisational efficiency. In most corporate organisational contexts, the objective behind creating a framework is to identify the competencies that truly have impact in business results (Rejas-Muslera, Urquiza, & Cepeda, 2012). Competency models are highly useful in ensuring that employees are doing the right things, clarifying and articulating what is required for effective performance, such models help organisations align internal behaviours and skills with the strategic direction of the company as a whole (Lucia & Lepsinger, 1999). One advantage of competency models is that they communicate what is important to the organisation's leadership and drive performance in desired areas. Competency models usually include a comprehensive array of factors associated with success – technical, leadership, interpersonal and personal.

2. Competency and competency model

While competency models have been enormously popular and adopted by many organisations, there has been a debate and lack of clear definition about what a competency is. A competency is a combination of tacit and explicit knowledge, behaviour and skills that gives someone the potential for effectiveness in task performance (Draganidis & Mentzas, 2006). A specific competency can also be understood as an underlying characteristic of a person, i.e., a trait, a belief, an ability or an attitude that distinguishes one person from another and explains differences in job performance (Banfield & Kay, 2012). With knowledge referring to a person's representation of facts, procedures, and principles about someone or something, skills describing important specific learned activities, and attitudes referring to a person's personal feeling, disposition, or position toward a person, an object or a subject (Osagie, Wesselink, Blok, Lans, & Mulder, 2016).

Competencies can be defined also as 'high level routines (or collection of routines) that, together with its implementing input flows, confers upon an organisation's management a set of decision options for producing significant outputs of a particular type' (Winter, 2000; Winter, 2003). Hereby, the routines refer to 'behaviour that is learned, highly patterned, repetitious, or quasi-repetitious, founded in part in tacit knowledge' (Ritter, 2006, p. 1033).

The collection of competencies is called competency models and is a way to get organisations to pay attention to job-related information and employee skills in the management of employees (Campion et al., 2011). Competency models are used to distinguish top performers from average performers and also inform managers whom to reward, promote or develop. The competence model is an approach to management centred around employee competence, unlike classical management models which focused on the qualifications and/or characteristics and intelligence of individual employees. (Baran & Kłos, 2014; Olesen, White, & Lemmer, 2007). One advantage that competency models offer is that they provide a foundation for developing integrated human resources systems, such as staffing, training, promotion, succession planning, and performance management. Such models can also help to transform the culture of a company to the extent that new competencies are defined and valued for future success (Pulakos, 2009; Silzer & Dowell, 2009). However, the number and specificity of the competencies needed depend on their intended use, for example:

- To make entry-level staffing decisions, broad ability and personality competencies are typically developed and assessed, such as critical thinking, conscientiousness, and interpersonal skills.
- In that purpose is staffing for a job that requires highly specialised skills, more specific technical competencies need to be identified and measured.
- For training and career development, competencies need to include more general capabilities as well as specialised technical knowledge and skills.
- For performance management purposes, higher-level competencies that reflect the major performance requirements are typically used for a job. Organisations usually identify between five and twelve higher-level competencies that are linked to their strategic objectives and critical success factors.

While novice developers of performance management systems are sometimes tempted to include a large number of very specific competencies in their systems, rating and providing feedback on a large number of competencies take a considerable amount of time. Systems that contain too many competencies are not viewed positively or as practical by managers with many direct reports to evaluate. In addition, the number of competencies selected for performance management purposes is much less important than ensuring that those selected are well defined and reflect the most critical aspects of the job (Pulakos, 2009).

‘The primary role of competency models is to align employee behaviour to firm strategy, it is suggested that their effectiveness should be evaluated through the lens of organisational culture or climate theories, both of which suggest that a strategy’s success depends on how employees throughout an organisation understand and act on that strategy, because the purpose of a competency model is to influence strategically aligned behaviour by outlining the behavioural themes that are expected and rewarded across all jobs in the organization’ (Sanchez & Levine, 2009 as cited in Serim, Demirbağ, & Yozgat, 2014, p. 1102). Employee outcomes are influenced by the perception of competency models by employees in the organisation. Redmond (2013) defines employee perceptions of competency models as the degree to which employees think that the organisation’s competency model is relevant strategically and personally and that they are rewarded according to the behaviour indicated by the competency model. Generally, employees’ perception on competency modelling is based on relevance and fairness. ‘Relevance’ indicates whether employees perceive competency models as important to reach both organisational and individual goals. ‘Fairness’ is related to employee perceptions whether competency models are unbiased. Fairness is often assessed along the dimension of distributive justice, referring to the perceived fairness of rewards (Bowen, Gilliland, & Folger, 1999).

Understanding the value of competency models to various HRM systems will help to judge how to best apply them in the organisation. It will also help to determine the scope of a project as well as the key stakeholders whose support is required for it to succeed (Horváthová & Mikušová, 2012). Table 1 summarises the benefits of using competency models for each HRM system.

Models designed for selection, training and development purposes usually describe technical competencies in terms of their antecedent skills and knowledge, at a detailed

Table 1. Benefits of competency models in HRM systems.

HRM system	Benefits
Selection	<p>Provides a complete picture of the job requirements.</p> <p>Increases the likelihood of hiring people who will succeed in the job.</p> <p>Minimises the investment (both time and money) in people who may not meet the company's expectation.</p> <p>Ensures a more systematic interview process.</p> <p>Help to distinguish between competencies that are trainable and those that are more difficult to develop.</p>
Training and development	<p>Enables people to focus on skills, knowledge, and characteristics that have the most impact on effectiveness.</p> <p>Ensures that training and development opportunities are aligned with organisational values and strategies.</p> <p>Makes the most effective use of training and development time and dollars.</p> <p>Provides a framework for ongoing coaching and feedback.</p>
Performance appraisal	<p>Provides a shared understanding of what will be monitored and measured.</p> <p>Focuses and facilitates the performance appraisal discussion.</p> <p>Provides focus for gaining information about a person's behaviour on the job.</p>
Succession planning	<p>Clarifies the skills, knowledge, and characteristics required for the job or the role.</p> <p>Provides a method to assess a candidate's readiness for the role.</p> <p>Focuses training and development plans to address missing competencies.</p> <p>Allows an organisation to measure its 'bench strength' (number of high-potential performers).</p>

Source: Lucia and Lepsinger (1999, p. 23).

level. Those designed to promulgate behavioural repertoires and citizenship behaviours or organisational competencies typically describe competencies at a higher level. Regardless of an approach, a competency model should provide an operational definition for each competency, together with measurable or observable performance indicators or standards against which to evaluate individuals (Markus, Cooper-Thomas, & Allpress, 2005).

3. AHP method and saaty's method of determining weights

When creating a competency model, the quantitative pairwise comparison (i.e., Saaty's method) has been used. In this method, all pairs of criteria are compared and the evaluation is stored in a so-called Saaty's matrix $S = (s_{ij})$, when $i, j = 1, 2, \dots, k$. Elements of the matrix are interpreted as estimates of the proportion of weights of i -th (w_i) and j -th (w_j) criteria (Fiala, 2008):

$$s_{ij} \approx \frac{w_i}{w_j}; \quad i, j = 1, 2, \dots, k. \quad (1)$$

$$S_{ij} \in [1/9; 9]$$

The actual comparison of criteria states the size of a preference, which is expressed by a specific number of points from the selected scale. When comparing it is determined not only whether one criterion is preferred over the other, but also to what extent it is better. This allows the user to better specify preferences for individual criteria and to make the result of the final decision more exact.

Table 2. The fundamental scale.

Intensity of importance	Definition	Explanation
1	Equal importance	Two activities contribute equally to the objective.
3	Moderate importance	Experience and judgment slightly favour one activity over another.
5	Strong importance	Experience and judgment strongly favour one activity over another.
7	Very strong or demonstrated importance	An activity is favoured very strongly over another; its dominance demonstrated in practice.
9	Extreme importance	The evidence favouring one activity over another is of the highest possible order of affirmation.

Source: Saaty (2000, p. 73).

Saaty recommends using the nine-point scale, whose odd stages are provided with descriptors listed in Table 2.

An even number of points indicates intermediate stages and is used for a softer distinction of preferences. Reasons for the selected range of a scale are the circumstances that all elements should be of the same order. Matrix S is a square matrix of $n \times n$ order, for whose elements applies the following:

$$s_{ij} = 1/s_{ji}, \quad i, j = 1, 2, \dots, k, \quad (2)$$

Thus, matrix S is reciprocal. On the diagonal of matrix S , there is always value one (each criterion is equivalent to itself). Before counting the weight of individual criteria, it is necessary to verify if the specified matrix of paired comparisons is consistent. It is identified by the fact that there is no conflict in the task of the individual pairwise comparison. The degree of consistency can be assessed in various ways, one of them is e.g., the consistency index defined as:

$$CI = \frac{(\lambda_{\max} - n)}{(n - 1)} \quad (3)$$

where λ_{\max} is the largest own number of matrix S and n is the number of criteria. Matrix S is consistent enough, if $CI < 0,1$ (Saaty & Vargas, 2001).

The calculation of weights from the Saaty's matrix can be done in several ways. The default (Saaty's) procedure is based on calculating the own vector of the matrix \mathbf{v} according to the formula:

$$\mathbf{S} \cdot \mathbf{v} = \lambda_{\max} \cdot \mathbf{v} \quad (4)$$

One of the simpler, approximate and frequently used methods is to determine the weights using the weighted geometric mean of the rows of decision matrix \mathbf{S} . We obtain approximate weights of w_i criteria by normalising these averages (their division by the sum of these geometric means).

$$w_i = \frac{\left[\prod_{j=1}^k s_{ij} \right]^{\frac{1}{k}}}{\sum_{i=1}^k \left[\prod_{j=1}^k s_{ij} \right]^{\frac{1}{k}}} \text{ for } i = 1, \dots, k. \quad (5)$$

If matrix S is consistent, the difference between the weights determined by own v_i values and approximate weights of w_i obtained as the normalised geometric mean of rows of matrix S is minimal.

Saaty's method of determining weights is the basis for AHP decision-making method (Analytic Hierarchy Process). The AHP method combines quantitative and qualitative approach to the evaluation of individual sub-variants, and the result is not only the quantification of individual variants of decision, but also the proposal of the optimal solution and a sensitivity analysis – i.e., an evaluation of the response of a model to changes in input variables (Zajarošová & Kauerová, 2014). Moreover, the method is hierarchical and allows decomposing complex unstructured situations into simpler components, thus to create a multi-stage decision-making processes. The hierarchical structure of the AHP process is a linear structure comprising several levels and each of them comprises several elements. Individual levels of the hierarchical structure correspond to a layout from general to specific – the more general the elements are in relation to the decision-making problem, the higher level in the structure they occupy and vice versa. The highest level of the hierarchy always contains only one element, which is the goal of the evaluation, on the contrary the lowest level presents individual options (alternatives) of solutions (see Figure 1).

A typical task of a multicriteria analysis of variants with three levels contains the following levels:

- Level 1 – aim of evaluation
- Level 2 – individual evaluation criteria
- Level 3 – assessed options

The solution takes place in three steps:

1. Hierarchical structure of objectives, criteria and decision alternatives at several different levels with an increasing priority up to the top level are created. Each level contains parts with similar characteristics that allow the comparison.
2. The pairwise comparison using Saaty's matrices is done at each level of the hierarchy. Starting with the top level we go down. Individual matrices of pairwise comparison are created and vectors of weights of individual parts (criteria, variants) are estimated on their basis.
3. These estimated weights are gradually combined with the aim to get aggregated weights of all possible solutions, then the option with the biggest aggregated weight is chosen.

In this paper, the AHP method will be used for the creation of competency model for the position of a sales manager. The three-stage model contains (1) the aim of evaluation on the highest level and three sets of competencies on the second level –

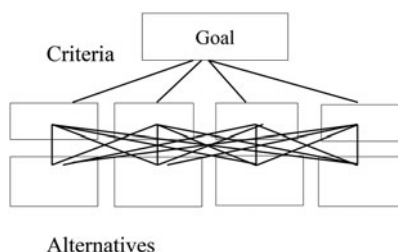


Figure 1. Three level hierarchy.

Source: Saaty (2000, p. 95)

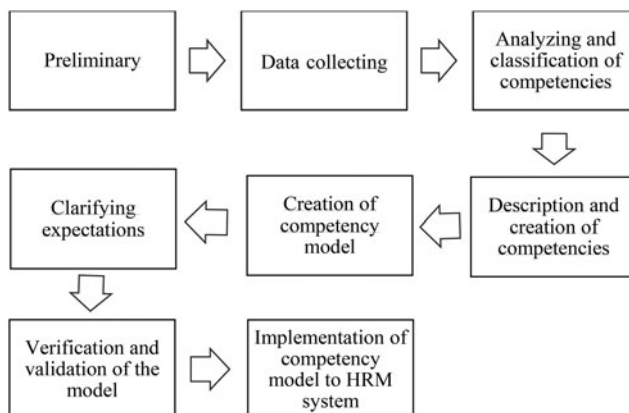


Figure 2. Process of competency model creation.

Source: Authors

managerial, technical and interpersonal competencies, which are mutually compared by Saaty's matrix. On the third level, each group of competencies is divided into several specific competencies (four to five) that are compared by the Saaty's matrix again within the given group.

4. Methodology of the creation of competency model for the position of a sales manager

The process of the competency model proposal for the selected job position has been divided into eight phases (see Figure 2):

1. Preliminary phase. At this stage, information about aims, strategic plans, critical success factors, vision, mission and the organisational structure of the selected organisation was obtained.
2. Phase of data obtaining. The objective of this phase was to obtain detailed information about the job position for which the competency model will be created. The technique of a panel of experts, the technique of direct observation and the analysis of job tasks were used to identify the competencies.
3. Phase of analysis and classification of competencies. The database of competencies was created on the basis of obtained and subsequently processed information

Table 3. Scale of the importance of competencies.

Scale of importance	Description of degrees of importance
1	Competency has marginal significance for achieving an excellent level of performance.
2	Competency is important for achieving an excellent level of performance.
3	Competency is very important for achieving an excellent level of performance.
4	Competency has decisive significance for achieving an excellent level of performance.

Source: Authors.

Table 4. Competency levels.

Competency level	Description of level
1	Weak level
2	Basic level
3	Intermediate level
4	High level
5	Excellent level

Source: Authors.

from the direct observation, an analysis of job tasks and the used technique of a panel of experts.

4. Phase of description and creation of competencies. The objective of this phase was to describe selected competencies. A scale of the importance of competencies was created, i.e., how important the given competency is for successful functioning on a given position (see [Table 3](#)).

It was also necessary to define the level of competencies. It means to describe different manifestations of competency according to the level of its development. The description of individual levels begins with the negative demonstration of behaviour within the given competency and it continues through a developed level up to manifestations indicating a high level of competency development. Competency levels serve for the assessment of the level of development of individual employees' competency (see [Table 4](#)).

5. Phase of creation of competency model. The AHP method, which is based on the previously mentioned Saaty's method of determining weights, was used for the creation of a competency model. In order to use the AHP method, selected competencies were divided into three groups: managerial, interpersonal and technical competency. Managerial Competencies are created by skills and abilities that contribute to an excellent performance of a manager. However, it is not only the ability and capability of a manager but also his/her willingness and engagement to fulfil work tasks (Horváthová, Bláha, & Čopíková, 2016). These competencies include knowledge, skills, and abilities such as managing time to ensure productivity, building networks inside and outside the work place, treating people with respect, inspiring and motivating others, leading the organisation through conflict, strategic thinking, delegating, and considering ethical implications before making decisions. Interpersonal competencies include interactions with others, as well as including negotiation and providing feedback to staff members. These set of competencies are known as soft or behavioural competencies. Competencies such as self-awareness, self-control, team work, conflict resolution, relationship, empathy and others are considered as behavioural or interpersonal competencies.

Interpersonal competencies also relate to communication functions such as writing, speaking, and listening (Kandula, 2013; Koenigsfeld, Kim, Cha, Perdue, & Cichy, 2012). Technical competencies define what people have to know and be able to do (specific work-related professional knowledge, skills and behaviours) in order to carry out and meet performance expectations and are sometimes known as hard skills (Armstrong & Taylor, 2014; Reio & Sutton, 2006). The decomposition of competencies using the AHP method is shown in Figure 3.

The competency model for the selected job position was created from competencies shown in this figure. Both competencies on the first level (managerial, interpersonal and technical) and competencies in these particular groups (the second level) were mutually compared using Saaty's method of determining weights. The comparison was done by the 14 superiors (86% of men and 14% of women; 43% aged 30–44, 36% aged 45–60 and 21% aged more than 60; 79% with university education and 21% with secondary education; all from manufacturing industry) of the selected job position and by the 14 holders (71% of men and 29% of women; 79% aged 30–44 and 21% aged 45–60 and; 29% with university education and 71% with secondary education; all from manufacturing industry) of the job position (a total of 28 evaluators from 14 manufacturing industry organisations, thus two evaluators – one superior of the selected job position and one job holder – from each of these 14 manufacturing industry organisations). Data collection took place using the prepared tables in MS Excel, in which the evaluators compared competencies mutually by assigning them individual scales.

The aim was to determine which competencies are most valuable for the given job position. Paired comparisons of the first level of competencies are presented in Tables 5–6. Graphical presentation of the distribution of weights is illustrated in Figures 4–5. It is apparent that respondents highly evaluated interpersonal competencies, which reached the level of importance of 54.99% and 49.34%.

Paired comparisons of the second level of competencies are presented in Tables 7–12.

Graphical presentations of the distribution of weights are illustrated in Figures 6–11.

Subsequently, global weights of all competencies were calculated. The results of the modification of the model revealed facts stated below.

Table 5. First level of competencies – paired comparisons (managing director).

Matrix S	Managerial competencies	Interpersonal competencies	Technical competencies	Geomean	Weight w	$S \times w$	$(S \times w)_i/w_i$
Managerial competencies	1	1/2	1/2	0.6300	19.58	0.5979	3.0536
Interpersonal competencies	2	1	2	1.5874	49.34	1.5066	3.0536
Technical competencies	2	1/2	1	1.0000	31.08	0.9491	3.0536
Total				3.2174	100		
$\lambda_{\max}=3.0536$	N = 3		RI = 0.580		CI = 0.0268		CR = 0.0462

Notes: geomean = geometric mean, w = Saaty's weight vector, w_i = i -th element of vector w (weight of i -th criteria in %), λ_{\max} = the largest eigenvalue of the matrix S , RI = random index, N = number of criteria, CI = consistency index, CR = consistency ratio (≤ 0.1)

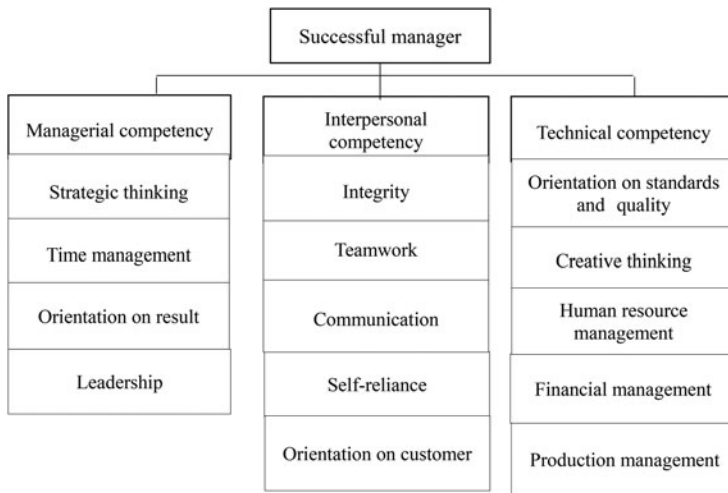
Source: Authors.

Table 6. First level of competencies – paired comparisons (sales manager).

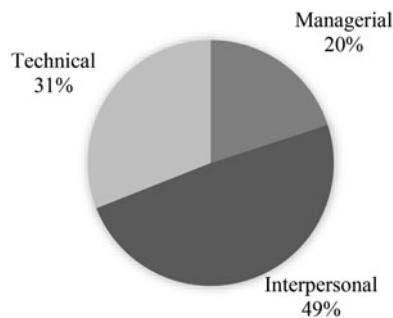
Matrix S	Managerial competencies	Interpersonal competencies	Technical competencies	Geomean	Weight w	$S \times w$	$(S \times w)_i / w_i$
Managerial competencies	1	1/2	1	0.7937	24.02	0.7250	3.0183
Interpersonal competencies	2	1	3	1.8171	54.99	1.6599	3.0183
Technical competencies	1	1/3	1	0.6934	20.98	0.6334	3.0183
Total				3.3042	100		
$\lambda_{\max}=3.0183$	N = 3	RI = 0.580		CI = 0.0091			CR = 0.0158

Notes: geomean = geometric mean, w = Saaty's weight vector, w_i = i-th element of vector w (weight of i-th criteria in %), λ_{\max} = the largest eigenvalue of the matrix S , RI = random index, N = number of criteria, CI = consistency index, CR = consistency ratio (≤ 0.1)

Source: Authors.

**Figure 3.** Decomposition of competencies using the AHP method.

Source: Authors

**Figure 4.** First level of competencies – paired comparisons (managing director).

Source: Authors

- It has shown up that all fourteen competencies are required for the position of a sales manager. Despite the fact that the weights for competencies as 'Strategic Thinking' and 'Creative Thinking' are low, they should be included

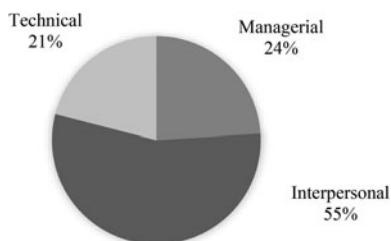


Figure 5. First level of competencies – paired comparisons (sales manager).

Source: Authors

Table 7. Managerial competencies – paired comparisons (managing director).

Matrix S	L	ST	OR	TM	Geomean	Weight w	$S \times w$	$(S \times w)_i/w_i$
L	1	2	1/4	3	1.1067	22.47	0.9795	4.3594
ST	1/2	1	1/4	1/2	0.5000	10.15	0.4172	4.1093
OR	4	4	1	3	2.6321	53.44	2.2574	4.2242
TM	1/3	2	1/3	1	0.6866	13.94	0.5955	4.2716
					4.9254	100		
$\lambda_{\max}=4.2411$		N = 4		RI = 0.900		CI = 0.0804		CR = 0.0893

Notes: L = leadership, ST = strategic thinking, OR = orientation on results, TM = time management, geomean = geometric mean, w = Saaty's weight vector, w_i = i-th element of vector w (weight of i-th criteria in %), λ_{\max} = the largest eigenvalue of the matrix S , RI = random index, N = number of criteria, CI = consistency index, CR = consistency ratio (≤ 0.1).

Source: Authors.

Table 8. Managerial competencies – paired comparisons (sales manager).

Matrix S	L	ST	OR	TM	Geomean	Weight w	$S \times w$	$(S \times w)_i/w_i$
L	1	3	1/2	2	1.3161	27.54	1.1152	4.0494
ST	1/3	1	1/4	1/3	0.4082	8.54	0.3517	4.1166
OR	2	4	1	3	2.2134	46.32	1.8837	4.0667
TM	1/2	3	1/3	1	0.8409	17.60	0.7244	4.1164
					4.7786	100		
$\lambda_{\max}=4.0873$		N = 4		RI = 0.900		CI = 0.0291		CR = 0.0323

Notes: L = leadership, ST = strategic thinking, OR = orientation on results, TM = time management, geomean = geometric mean, w = Saaty's weight vector, w_i = i-th element of vector w (weight of i-th criteria in %), λ_{\max} = the largest eigenvalue of the matrix S , RI = random index, N = number of criteria, CI = consistency index, CR = consistency ratio (≤ 0.1).

Source: Authors.

in the competency model according to the opinion of authors. A sales manager is partially involved in the creation of a business strategy in cooperation with the managing director and his superiors (sales director) from the parent company. It is also important that the sales manager is able to assess the risks and eliminate them.

- Sales manager and his superior (managing director) have a different view primarily on competency 'Human Resources Management' (sales manager – 26.93% and managing director – 37.68%). Authors consider the competency as very important, because all managers in organisations are human resource managers, regardless of their position in the hierarchy of management functions. Anyone who manages work if only of one another employee, performs series of personal activities. The effectiveness of this management does not

Table 9. Interpersonal competencies – paired comparisons (managing director).

Matrix S	I	C	TW	SR	OC	Geomean	Weight w	$S \times w$	$(S \times w)_i/w_i$
I	1	1/2	1/2	1/2	1/2	0.5743	10.61	0.5530	5.2141
C	1	1	2	1	1/2	1.0000	18.47	0.9299	5.0357
TW	2	1/2	1	1/3	1/3	0.6444	11.90	0.6202	5.2119
SR	2	1	3	1	1/3	1.1487	21.21	1.0920	5.1477
OC	2	2	3	3	1	2.0477	37.81	1.9530	5.1647
						5.4151	100		
$\lambda_{\max}=5.1548$ $N=5$ $RI=1.120$ $CI=0.0387$ $CR=0.0346$									

Notes: I = integrity, C = communication, TW = teamwork, SR = self-reliance, OC = orientation on customer, geomean = geometric mean, w = Saaty's weight vector, w_i = i-th element of vector w (weight of i-th criteria in %), λ_{\max} = the largest eigenvalue of the matrix S, RI = random index, N = number of criteria, CI = consistency index, CR = consistency ratio (≤ 0.1).

Source: Authors.

Table 10. Interpersonal competencies – paired comparisons (sales manager).

Matrix S	I	C	TW	SR	OC	Geomean	Weight w	$S \times w$	$(S \times w)_i/w_i$
I	1	1/2	1/2	1/2	1/2	0.5743	10.82	0.5541	5.1227
C	1	1	1/3	1	1/2	0.6988	13.16	0.6967	5.2936
TW	2	3	1	1/2	1/3	1.0000	18.83	1.0262	5.4489
SR	2	1	2	1	1/2	1.1487	21.63	1.1187	5.1713
OC	2	2	3	2	1	1.8882	35.56	1.8327	5.1541
						5.3100	100		
$\lambda_{\max}=5.2381$ $N=5$ $RI=1.120$ $CI=0.0595$ $CR=0.0532$									

Notes: I = integrity, C = communication, TW = teamwork, SR = self-reliance, OC = orientation on customer, geomean = geometric mean, w = Saaty's weight vector, w_i = i-th element of vector w (weight of i-th criteria in %), λ_{\max} = the largest eigenvalue of the matrix S, RI = random index, N = number of criteria, CI = consistency index, CR = consistency ratio (≤ 0.1).

Source: Authors.

Table 11. Technical competencies – paired comparisons (managing director).

Matrix S	OSQ	CT	HRM	PM	FM	Geomean	Weight w	$S \times w$	$(S \times w)_i/w_i$
OSQ	1	2	1/2	3	1/2	1.0845	18.84	1.0342	5.4889
CT	1/2	1	1/4	1/3	1/3	0.4251	7.39	0.3826	5.1796
HRM	2	4	1	2	3	2.1689	37.68	2.0001	5.3080
PM	1/3	3	1/2	1	1/2	0.7579	13.17	0.7191	5.4641
FM	2	3	1/3	2	1	1.3195	22.92	1.2166	5.3070
						5.7559	100		
$\lambda_{\max}=5.3490$ $N=5$ $RI=1.120$ $CI=0.0872$ $CR=0.0779$									

Notes: OSQ = orientation on standards and quality, CT = creative thinking, HRM = human resource management, PM = production management, FM = financial management, geomean = geometric mean, w = Saaty's weight vector, w_i = i-th element of vector w (weight of i-th criteria in %), λ_{\max} = the largest eigenvalue of the matrix S, RI = random index, N = number of criteria, CI = consistency index, CR = consistency ratio (≤ 0.1).

Source: Authors.

Table 12. Technical competencies – paired comparisons (sales manager).

Matrix S	OSQ	CT	HRM	PM	FM	Geomean	Weight w	$S \times w$	$(S \times w)_i/w_i$
OSQ	1	3	2	3	2	2.0477	35.54	1.8560	5.2223
CT	1/3	1	1/3	1/3	1/3	0.4152	7.21	0.3814	5.2917
HRM	1/2	3	1	3	2	1.5518	26.93	1.4090	5.2311
PM	1/3	3	1/3	1	1	0.8027	13.93	0.7276	5.2226
FM	1/2	3	1/2	1	1	0.9441	16.39	0.8318	5.0761
						5.7616	100		
$\lambda_{\max}=5.2088$ $N=5$ $RI=1.120$ $CI=0.0522$ $CR=0.0466$									

Notes: OSQ = orientation on standards and quality, CT = creative thinking, HRM = human resource management, PM = production management, FM = financial management, geomean = geometric mean, w = Saaty's weight vector, w_i = i-th element of vector w (weight of i-th criteria in %), λ_{\max} = the largest eigenvalue of the matrix S, RI = random index, N = number of criteria, CI = consistency index, CR = consistency ratio (≤ 0.1).

Source: Authors.



Figure 6. Managerial competencies – paired comparisons (managing director).
Source: Authors

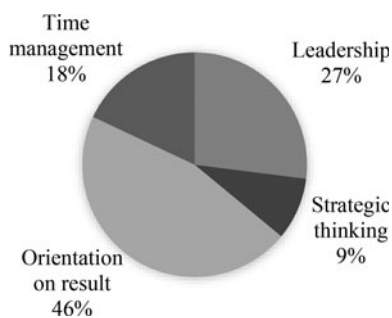


Figure 7. Managerial competencies – paired comparisons (sales manager).
Source: Authors



Figure 8. Interpersonal competencies – paired comparisons (managing director).
Source: Authors



Figure 9. Interpersonal competencies – paired comparisons (sales manager).
Source: Authors

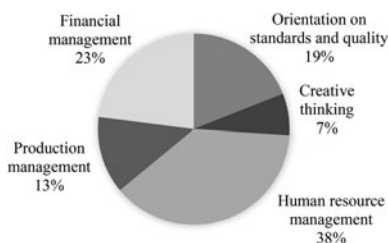


Figure 10. Technical competencies – paired comparisons (managing director).

Source: Authors



Figure 11. Technical competencies – paired comparisons (sales manager).

Source: Authors

affect only the performance of individual employees, but also the performance of the entire organisation. Of course we cannot expect that these managers are specialists in the field of human resources management, but nevertheless it is important that all managers are familiar with at least some necessary level of knowledge and skills, which is needed to fulfil tasks in human resources management.

- According to the authors, the managing director assigned low weight for the competency of 'Orientation on standards and quality'. However, the competency is very important for the performance of a sales manager, because he should know all organizations' rules and procedures for his work and abide by them. He should care about the quality of his work and his superiors too. He should be systematic and meet the deadline.

The arithmetic mean was calculated from global weights for each competency. On the basis of these final values and above mentioned facts, authors assigned levels of importance to these competencies according to [Table 3](#). Using a questionnaire, the required level of individual competencies was subsequently determined. The questionnaire was filled by a superior of the specific job position (Managing director) and by the holder of a job position (Sales manager). There were defined all competencies in the questionnaire including the description of particular levels of the competence development and a table with levels of the competences ([Table 4](#)). Employees were asked to determine the required level of individual competencies for the job position. The results of questioning relating to the required level of competencies are shown in [Figure 12](#).



Figure 12. Target level of competencies.

Source: Authors

As it is apparent from this graph, the sales manager and his superior have a different view on these competencies: strategic thinking, leadership, orientation on customer and financial management. The next step for the creation of a final form of a competency model is to clarify different views on the importance of competencies and their target level.

6. Phase of clarifying expectations. The proposed competency model including descriptions of individual levels of the competence development, the proposed level of importance and results of the questionnaire survey dealing with the required level of competencies were handed over to selected respondents with an explanation of further advancement towards the creation of a competency model for the position of Sales manager. Managing director and Sales manager agreed on the levels of importance and target values of competencies during their discussion. The competency model for the selected position was created on the basis of these facts. The proposed competency model for the position of a sales manager is shown in Table 13. Due to the extensiveness of the competency model, there are not defined individual levels of competencies in detail, but there are stated examples of observable behaviour for each competency that correspond to the target value (desired level).
7. Phase of verification and validation of the created model. In this step, it will be practically verified if the competency model really described such behaviour thanks to which the sales manager achieves excellent results. It means, if it is possible to rely on the created competency model in the selection, assessment, training and development of managers. The process of the verification and validation of a competency model was already partially done through the questionnaire survey. There were verified required competencies, the level of importance and target level of these competencies on the basis of the questionnaire. The authors proposed to transform descriptions of behaviour of individual competencies into the questionnaire items and create a tool for 360° feedback as other way of validation.

Table 13. Competency model for the position of a sales manager.

Competency		Examples of observable behavior	Target value	Importance
Managerial competencies	Strategic thinking	He/she is able to cooperate on the creation of strategy. He/she thinks forward. He/she is able to estimate potential internal and external factors that affect business activities in advance.	3	2
	Time management	He/she does short and long term plans with regard to plans of other individuals and institutions. He/she can distinguish what is urgent and important, and according to that he/she decides and acts. He/she creates variants of a plan.	4	3
	Orientation on result	His/her performance is reliable and stable. He/she sets demanding but achievable goals. He/she focuses on the performance and the result. He/she is capable of self-control and self-motivation, including self-improvement. Tasks are fulfilled till the required date.	4	3
	Leadership	He/she distinctly feels responsibility for his/her decisions and work results. He/she brings people together. He/she checks the implementation of goals and tasks and uses the formal authority and power in the right way. He/she promotes team spirit and tries to improve the performance of a team / group.	4	3
Interpersonal competencies	Integrity	He/she is identified with the policy of the organisation and applies it. He/she is consistent with the values of the organisation. He/she knows the vision and strategy of the organisation. His/her words are consistent – he/she does what he/she says and keeps his/her promises. He/she contributes to the promotion of the organisation.	4	3
	Orientation on customer	He/she can identify and satisfy customer's needs. He/she has friendly and pleasant manner. He/she realises the responsibility for customer's satisfaction. He/she tries to get the feedback and is able to communicate with a customer and go beyond the formal communication. He/she responds on time and handles customer's requests.	4	4
	Self-reliance	He/she fulfils all given tasks separately and reliably and searches for assistance if it is necessary. He/she manages him-/herself when fulfilling routine tasks, he/she needs help with demanding tasks. He/she is not afraid of responsibility and accepts a certain level of risk.	4	4
	Teamwork	He/she actively cooperates within a team and has a positive role in a team. He/she shares and offers information. His/her activities are oriented to team goals. He/she takes into account ideas and opinions of others.	4	3
	Communication	His/her formulation of ideas in a written and oral form is on a very good level. He/she actively listens to others. Healthy	4	3

(continued)

Table 13. Continued.

Competency		Examples of observable behavior	Target value	Importance
Technical competencies	Orientation on standards and quality	and reasonable self-promotion is natural for him/her. He/she has good presentation skills. He/she knows all rules and procedures for his/her work and almost always abide by them. He/she cares about the quality of his/her work. He/she carefully does his/her work. He/she respects rules and achieves quality results. He/she eliminates deviations and is systematic and almost always follows the terms.	4	4
	Creative thinking	He/she repeatedly comes up with suggestions for improvement. He/she accepts slow, gradually dosed changes. He/she is able to transmit attention between tasks.	3	2
	Human resource management	Knowledge of labour legislation and ability to orient in common labour law situations at the workplace. Familiar with internal regulations and standards in personnel area.	3	3
	Production management	He/she knows the production process and organisation of work at all workplaces. He/she knows products of the organisation.	3	3
	Financial management	Basic knowledge of financial indicators and financial management of a company. Familiar with accounting and tax issues. He/she is well informed about financial statements of the company.	3	3

Source: Authors.

8. Phase of implementation of a competency model to a human resource management system. The competency model will be mainly used for the selection, assessment, training and development of an employee in the selected organisation.

5. Conclusion

The paper provides practical and useful information about the possible procedures of the creation of competency models in the organisation for human resource specialists, managers at all levels and entrepreneurs. The aim of this paper was to create a competency model for the position of a sales manager in a manufacturing industry organisation. First, the methodology for the competency models' creation has been proposed, based on which the competency model has been created. The creation process was divided into these eight phases: preliminary phase, phase of data obtaining, phase of analysis and classification of competencies, phase of description and creation of competencies, phase of creation of competency model, phase of clarifying expectations, phase of verification and validation of the created model and phase of implementation of a competency model to a human resource management system. Methodology, which is not described in any scientific literature, was proposed for the competency model's creation by the utilisation of AHP method and Saaty's method. The created competency model contains fourteen competencies which are divided into three groups: managerial, interpersonal and technical competencies. Levels of

importance and target values were assigned to individual competencies in this competency model too. The created competency model allows an application of a holistic approach to human resources management based on competencies (recruitment and selection of employees, their assessment, training and development, promotion, etc.) through which they facilitate the work of managers and human resources managers and further contribute to strengthening and promotion of corporate values.

Models for the position of a sales manager have been implemented in 10 participated manufacturing organisations up to now and it has happened this year, so although the initial response to their use is positive, it is relatively short time for some detailed evaluation of the effectiveness of their implementation. This methodology of the creation of competency models has also been used in other production organisations, specifically for positions of HR manager, production manager, chief accountant, coach, supervisor of production, maintenance manager, production data manager, industrial engineer and logistics manager. This methodology has been used to create a competency model for the position of the tax administrators at the tax office as well.

When creating a competency model, the authors encountered a problem related to the use of Saaty's method. Respondents found this method too complicated. The aim of the authors' future scientific research and improvements is to find a new, simpler method for competencies classification than Saaty's method on which the proposed methodology is based. After a certain time from the implementation of the competence model, a process of investigation and evaluation of the effectiveness of its use (in the field of selection, training and development of employees, their evaluation and remuneration) could be proposed. Also other techniques could be used except the use of the panel of experts, the technique of direct observation and analysis of job tasks in the phase of data identification for the competency model creation for the selected job position. The proposed techniques are interviewing or the method of critical situations.

From a managerial implications point of view, we have found out (based on the research with superiors of the selected job position) that these superiors have an idea of what they demand from people asking for this position, but they are not clear about the extent to which the various requirements are significant. The authors' methodology offered a systematic, integrated approach how to create a set of required skills not only for the selected position but also for other positions and to evaluate their desired level which will be different for various positions. The proposed methodology can be used for any position in the organisation; however each organisation has to adapt the proposed methodology to its own specifics.

From a theoretical contribution point of view, the proposed and applied methodology of the creation of competency models can enrich the theoretical knowledge of competencies and competency models and thus to contribute to a wider concept of human resource management.

Results of the presented research supported the solution of the systematisation issue and the issue of skills structuring, which also brings an interconnection with practical implications. They have opened the issue of skills identification and evaluation that will change due to challenges such as digitisation, network economics and

so on in the future, which will also influence the importance of these skills. Furthermore, they demonstrated the interconnection of different scientific disciplines – humanitarian human resource management and multi-criteria decision making, and brought this link into practical use.

Limitations of the research may be based on the subjectivity of the evaluator's views when comparing competencies, as well as on the number of evaluators and type of organisations in which the research was conducted. All respondents were from the manufacturing industry, which also brings some limitations for generalisation and use in other branches.

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References

- Armstrong, M., & Taylor, S. (2014). *Armstrong's handbook of human resource management practice*. London: KoganPage.
- Banfield, P., & Kay, R. (2012). *Introduction to human resources management*. Oxford: Oxford University Press.
- Baran, M., & Kłos, M. (2014). Competency models and the generational diversity of a company workforce. *Economics & Sociology*, 7, 209–217. doi:10.14254/2071-789X.2014/7-2/17
- Bowen, D. E., Gilliland, S. W., & Folger, R. (1999). HRM and service fairness: How being fair with employees spills over to customers. *Organizational Dynamics*, 27(3), 7–23. doi:10.1016/S0090-2616(99)90018-9
- Campion, M. A., Fink, A. A., Ruggeberg, B. J., Carr, L., Phillips, G. M., & Odman, R. B. (2011). Doing competencies well: Best practices in competency modelling. *Personnel Psychology*, 64(1), 225–262. doi:10.1111/j.1744-6570.2010.01207.x
- Cardy, R. L., & Selvarajan, T. T. (2006). Competencies: Alternative frameworks for competitive advantage. *Business Horizons*, 49(3), 235–245. doi:10.1016/j.bushor.2005.09.004
- Draganidis, F., & Mentzas, G. (2006). Competency based management: A review of systems and approaches. *Information Management & Computer Security*, 14, 51–64. doi:10.1108/09685220610648373
- Fiala, P. (2008). *Modely a metody rozhodování*. [Decision making models and methods]. Praha: Oeconomica.
- Horváthová, P., Bláha, J., & Čopíková, A. (2016). *Řízení lidských zdrojů. Nové trendy*. [Human resource management. The new trends]. Praha: Management Press.
- Horváthová, P., & Mikušová, M. (2012). The use of talent management by organizations in one of the regions of the Czech Republic. *Actual Problems of Economics*, 136(10), 526–535.
- Kandula, S. R. (2013). *Competency-based human resource management*. Delhi: PHI Learning Private Limited.

- Koenigsfeld, J. P., Kim, S., Cha, J., Perdue, J., & Cichy, R. F. (2012). Developing a competency model for private club managers. *International Journal of Hospitality Management*, 31(3), 633–641. doi:10.1016/j.ijhm.2011.08.007
- Lucia, A. D., & Lepsinger, R. (1999). *The art and science of competency models. Pinpointing critical success factors in organizations*. San Francisco: Pfeiffer.
- Markus, L. H., Cooper-Thomas, H., & Allpress, K. N. (2005). Confounded by competencies? An evaluation of the evolution and use of competency models. *Journal of Psychology*, 34, 117–126.
- McClelland, D. (1973). Testing for competence rather than for “intelligence.” *American Psychologist*, 28(1), 1–59.
- Olesen, C., White, D., & Lemmer, I. (2007). Career models and culture change at Microsoft. *Organization Development Journal*, 25, 31–35.
- Osagie, E. R., Wesselink, R., Blok, V., Lans, M., & Mulder, M. (2016). Individual competencies for corporate social responsibility: A literature and practice perspective. *Journal of Business Ethics*, 135(2), 233–252. doi:10.1007/s10551-014-2469-0
- Pulakos, E. D. (2009). *Performance management. A new approach for driving business results*. Hoboken: Wiley.
- Redmond, E. (2013). Competency models at work: The value of perceived relevance and fair rewards for employee outcomes. *Human Resource Management*, 52(5), 771–792. doi:10.1002/hrm.21560
- Reio, T. G., & Sutton, F. C. (2006). Employer assessment of work-related competencies and workplace adaptation. *Human Resource Development Quarterly*, 17(3), 305–324. doi:10.1002/hrdq.1176
- Rejas-Muslera, R., Urquiza, A., & Cepeda, I. (2012). Competency-based model through it: An action research project. *Systemic Practice and Action Research*, 25(2), 117–135. doi:10.1007/s11213-011-9213-9
- Ritter, T. (2006). Communicating firm competencies: Marketing as different levels of translation. *Industrial Marketing Management*, 35(8), 1032–1036. doi:10.1016/j.indmarman.2006.03.004
- Saaty, T. L. (2000). *Fundamentals of decision making and priority theory with the analytic hierarchy process*. Pittsburgh: RWS Publications.
- Saaty, T. L., & Vargas, L. G. (2001). *Models, methods, concepts & applications of the analytic hierarchy process*. Boston: Kluwer Academic Publishers.
- Serim, H., Demirbağ, O., & Yozgat, U. (2014). The effects of employees’ perceptions of competency models on employability outcomes and organizational citizenship behavior and the moderating role of social exchange in this effect. *Procedia - Social and Behavioral Sciences*, 150, 1101–1110. doi:10.1016/j.sbspro.2014.09.125
- Silzer, R., & Dowell, B. E. (2009). *Strategy-driven talent management: A leadership imperative*. Hoboken: John Wiley & Sons.
- Winter, S. G. (2000). The satisfying principle in capability learning. *Strategic Management Journal*, 21(10–11), 981–996. doi:10.1002/1097-0266(200010/11)21:10/11<981::AID-SMJ125>3.0.CO;2-4
- Winter, S. G. (2003). Understanding dynamic capabilities. *Strategic Management Journal*, 24(10), 991–995. doi:10.1002/smj.318
- Zajarošová, M., & Kauerová, L. (2014). Applying analytic hierarchy process to supplier selection. In *7th International Scientific Conference Managing and Modelling of Financial Risks, III*, 873–879. Retrieved from https://www.ekf.vsb.cz/export/sites/ekf/rmfr/cs/sbornik/Sbornik_parts/Sbornik_III.dil.pdf